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| APPLICATION NO. | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. | CONFIRMATION NO. |
|---|---|---|---|---|
| 10/821,790 | 04/09/2004 | Yu-Chong Tai | 020859-003210US | 9332 |

20350 7590 09/22/2006

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| EXAMINER | |
|---|---|
| SUNG, CHRISTINE | |
| **ART UNIT** | **PAPER NUMBER** |
| 2884 | |

DATE MAILED: 09/22/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

| Office Action Summary | Application No. | Applicant(s) | |
|---|---|---|---|
| | 10/821,790 | TAI ET AL. | |
| | Examiner | Art Unit | |
| | Christine Sung | 2884 | |

*-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --*

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

1)☒ Responsive to communication(s) filed on *30 June 2006*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

4)☒ Claim(s) *1-36* is/are pending in the application.

4a) Of the above claim(s) *26-36* is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-25* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

**Application Papers**

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *09 April 2004* is/are: a)☐ accepted or b)☒ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

### *Response to Amendment*

1. The amendment filed on June 30, 2006 has been accepted and entered.

### *Election/Restrictions*

2. Applicant's election of claim 1-25 in the reply filed on June 30, 2006 is acknowledged. Because applicant did not distinctly and specifically point out the supposed errors in the restriction requirement, the election has been treated as an election without traverse (MPEP § 818.03(a)).

### *Drawings*

3. The drawings are objected to as failing to comply with 37 CFR 1.84(p)(5) because they include the following reference character(s) not mentioned in the description: Figure 2, elements 208 and 201 are not disclosed. Corrected drawing sheets in compliance with 37 CFR 1.121(d), or amendment to the specification to add the reference character(s) in the description in compliance with 37 CFR 1.121(b) are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. Each drawing sheet submitted after the filing date of an application must be labeled in the top margin as either "Replacement Sheet" or "New Sheet" pursuant to 37 CFR 1.121(d). If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

4. The drawings are objected to as failing to comply with 37 CFR 1.84(p)(4) because reference character "219" has been used to designate both as Incident infrared radiation and the

substrate according to the specification (see paragraph [0026]). Corrected drawing sheets in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. Each drawing sheet submitted after the filing date of an application must be labeled in the top margin as either "Replacement Sheet" or "New Sheet" pursuant to 37 CFR 1.121(d). If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

5. The drawings are objected to as failing to comply with 37 CFR 1.84(p)(4) because reference characters "211" and "209" both point to the same object in Figure 2. Corrected drawing sheets in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. Each drawing sheet submitted after the filing date of an application must be labeled in the top margin as either "Replacement Sheet" or "New Sheet" pursuant to 37 CFR 1.121(d). If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

***Claim Objections***

6. Claims 2 and 18 recite the limitation "the sensing device" in line 1 of the respective claims. There is insufficient antecedent basis for this limitation in the claim. The parent claim

refers to a sensing apparatus/method of sensing as well as a detecting device but does not disclose a sensing device, and is therefore unclear.

7. Claim 7 objected to under 37 CFR 1.75 as being a substantial duplicate of claim 7. When two claims in an application are duplicates or else are so close in content that they both cover the same thing, despite a slight difference in wording, it is proper after allowing one claim to object to the other as being a substantial duplicate of the allowed claim. See MPEP § 706.03(k).

8. Claims 6-7 and 22 are objected to under 37 CFR 1.75(c), as being of improper dependent form for failing to further limit the subject matter of a previous claim. Applicant is required to cancel the claim(s), or amend the claim(s) to place the claim(s) in proper dependent form, or rewrite the claim(s) in independent form. The claim limitations only state that the detecting device is a sensing device and thus, does not further limit the parent claim.

9. Claim 19 is objected to under 37 CFR 1.75(c), as being of improper dependent form for failing to further limit the subject matter of a previous claim. Applicant is required to cancel the claim(s), or amend the claim(s) to place the claim(s) in proper dependent form, or rewrite the claim(s) in independent form. Claim 19 only contains the limitation that the electromagnetic radiation is IR radiation, however this limitation has already been included in the parent claim.

10. Claim 23 contains the trademark/trade name Parylene. Where a trademark or trade name is used in a claim as a limitation to identify or describe a particular material or product, the claim does not comply with the requirements of 35 U.S.C. 112, second paragraph. See *Ex parte Simpson*, 218 USPQ 1020 (Bd. App. 1982). The claim scope is uncertain since the trademark or trade name cannot be used properly to identify any particular material or product. A trademark or trade name is used to identify a source of goods, and not the goods themselves. Thus, a

trademark or trade name does not identify or describe the goods associated with the trademark or trade name. In the present case, the trademark/trade name is used to identify/describe polymers of paraxylene and, accordingly, the identification/description is indefinite.

***Claim Rejections - 35 USC § 102***

11. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

12. Claims 1-22, 24-25 are rejected under 35 U.S.C. 102(b) as being anticipated by Hara (US Pre Grant Publication 2001/0015810 A1).

Regarding claim 1, Hara discloses an integrated tunable sensing apparatus (Figure 10) for electromagnetic radiation, the sensing apparatus comprising:

a substrate (element 1), the substrate comprising a backside and a face;

a tunable cavity region (element Gap h) coupled to the backside of the substrate;

an elastic material (element 5) forming a region including the tunable cavity region;

a first reflection device (element 3) within a first portion of the tunable cavity region (see figure 10);

a second reflection device (element 4) within a second portion the cavity region and facing the first reflection device (see figure 10);

a movable gap (element Gap h) formed between the first reflection device and the second reflection device within the tunable cavity region (see figure 10);

an actuation device (paragraph [0076] and elements 7-10) coupled to the tunable cavity region, the actuation device being adapted to cause movement from a first predetermined spatial dimension to a second predetermined spatial dimension of the movable gap (see figures 13A-13C);

a detection device coupled to the tunable cavity (figure 16, element 24).

Regarding claim 2, Hara discloses that the sensing device (figure 10) comprises one of the reflection devices (element 3 and 4).

Regarding claim 3, Hara discloses that the electromagnetic radiation is IR (paragraph [0073]).

Regarding claims 4-5, Hara discloses that the first and second spatial dimensions are between 2.2-3.1 microns (Figures 13A-13C).

Regarding claims 6 and 7, Hara discloses that the detection device is a sensing device (Figure 16, element 24).

Regarding claim 8, Hara discloses that the apparatus further comprises a drive device coupled to the actuation device (paragraph [0149]).

Regarding claim 9, Hara does not explicitly state a control device coupled between the detection device and drive device, but it is inherent that some sort of device is controlling the changes in the gap width.

Regarding claim 10, Hara discloses that the substrate comprises a silicon wafer (paragraph [0074]).

Regarding claim 11, Hara discloses that the detection device is adapted to capture information associated with a selected wavelength range within an IR range of electromagnetic radiation having the selected wavelength range, the electromagnetic radiation having the selected wavelength range having a resonating characteristic between the first reflection device and the second reflection device within the tunable cavity region (paragraph [0083]).

Regarding claim 12, Hara discloses that the selected wavelength range is selected from 3-5 Microns and 8-14 Microns (see paragraph 0073]).

Regarding claim 13, Hara discloses tunable cavity region is free from electromagnetic radiation outside of the selected wavelength range having a resonating characteristic (see paragraph [0076], discloses that the cavity is tuned to a particular element).

Regarding claim 14, Hara discloses the movable gap is maintained at the second predetermined spatial dimension to provide the resonating characteristic of the electromagnetic radiation between the first reflection device and the second reflection device (see paragraph [0076], discloses that the cavity is tuned to a particular element).

Regarding claim 15, Hara discloses that the substrate, the elastic material, first reflection device, second reflection device, movable gap, actuation device and detection device (see claim 1 citations above) are enclosed in a package (see figure 31), the package having a window region (element 47) facing the backside of the substrate, the window region being adapted to allow electromagnetic radiation to traverse there through.

Regarding claim 16, Hara discloses that the package provides a vacuum (see claim 8) in the tunable cavity.

Regarding claims 17 and 19, Hara discloses method for sensing electromagnetic radiation having a predetermined spatial frequency, the method comprising:

providing a tunable cavity region (figure 10, element 1), the tunable cavity region comprising an elastic material (element 5) forming a region including the tunable cavity region, the tunable cavity region having a first reflection device (element 3) within a first portion of the tunable cavity region and having a second reflection device (element 4) within a second portion the cavity region and facing the first reflection device (see figure 10), the tunable cavity region having a movable gap (element Gap h) formed between the first reflection device and the second reflection device within the tunable cavity region (see figure 10);

moving the movable gap from a first predetermined spatial dimension to a second predetermined spatial dimension (see figures 13A-13C) using an actuation device (elements 8-10) coupled to the tunable cavity region;

causing a resonating characteristic of a selective wavelength corresponding to an IR band of electromagnetic radiation between the first reflection device and the second reflection device

within the tunable cavity while being maintained at the second predetermined spatial dimension (paragraph [0083]);

preventing one or more wavelengths outside of the selected wavelength from achieving the resonating characteristic between the first reflection device and the second reflection device while being maintained at the second predetermined spatial dimension (paragraph [0076]);

and capturing information associated with the selected wavelength using a detection device (figure 16, element 24) coupled to the tunable cavity region.

Regarding claim 18, Hara discloses that the sensing device (figure 10) comprises one of the reflection devices (element 3 and 4).

Regarding claims 20-21, Hara discloses that the first and second spatial dimensions are between 2.2-3.1 microns (Figures 13A-13C).

Regarding claims 22, Hara discloses that the detection device is a sensing device (Figure 16, element 24).

Regarding claim 24, Hara discloses that the apparatus further comprises a drive device coupled to the actuation device (paragraph [0149]).

Regarding claim 25, Hara discloses that the selected wavelength range is selected from 3-5 Microns and 8-14 Microns (see paragraph 0073]).

***Claim Rejections - 35 USC § 103***

13. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

14. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

15. Claim 23 is rejected under 35 U.S.C. 103(a) as being unpatentable over Hara (US Pre Grant Publication 2001/0017177 A1) in view of Belcher (US Patent 6,083,557 A).

Regarding claim 23, Hara discloses the limitations set forth in claim 17, but does not explicitly state that the elastic member is made of parylene. Parylene, a well known material used in construction of bolometers, is frequently used in bolometers in order to tightly seal bolometers, as well as provide an IR sensitive medium to detect IR radiation. (see Belcher claims 1 and 5). One of ordinary skill in the art would be motivated to use a parylene material in place of the oxide material disclosed by Hara in order to increase the sensitivity of the detector.

### *Conclusion*

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Christine Sung whose telephone number is 571-272-2448. The examiner can normally be reached on Monday- Friday 7-3 pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, David Porta can be reached on 571-272-2444. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

Christine Sung
Examiner
Art Unit 2884

OTILIA GABOR
PRIMARY EXAMINER

CS